FUNCTIONAL SPASM OF ACCOMMODATION*

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TRUE spasm of accommodation is one of the rare conditions met with in ophthalmology. Hirschberg writing in 1884 says: "I scarcely believe in the existence of acute and not at all in the existence of a chronic form of accommodative spasm. I have never seen one case out of many thousands tested by the ophthalmoscope and by glasses." Hess, in the second edition of Graefe-Saemisch's *Handbuch*, also expresses a similar belief as to the rarity of the condition. In the *Transactions* of the Ophthalmological Society there are only two papers dealing with the subject, one by Adams in Vol. II (page 180) in which he gives an account of two cases, and another by Fitzgerald in Vol. IV (page 311), also giving two cases.

As the term "spasm of accommodation" is frequently used by oculists, it is necessary for me to define what I mean when I use it in this paper, and to exclude certain types of cases to which the term is sometimes applied. In some young hypermetropes the ciliary muscle is maintained in a condition of partial contraction which may compensate partly or fully the amount of hypermetropia. This is not accommodative spasm and should not be called by that name. It is a physiological adaptation in the interests of clear vision, and in all probability is attained by the action of the circular ciliary muscle alone, which, like other sphincter muscles in the body, easily lends itself to the maintenance of a state of tonic contraction.

Again, a small degree of spasm of the ciliary muscle undoubtedly exists in a definite proportion of myopes, especially among uncorrected myopic school children. This seldom amounts to more than 1 D. or 2 D. and is not spasm of the accommodation in the sense in which I use the term here. It may only be a phenomenon associated with the increased convergence that uncorrected myopes and astigmatics adopt to get clearer vision. If so, it belongs to a category analogous to the class of hypermetropes spoken of above.

True spasm of accommodation may be defined as the sudden development in one or both eyes of a high degree of apparent myopia which disappears under the influence of atropine. The spasm may be either continuous or clonic, or may pass from a clonic to a continuous condition, and may be associated with spasm of other ocular muscles.

My first case occurred in a young lady, now aged 21, of good stock and excellent general health. At the age of five she was noticed to have a slight convergence of the left eye, and at that

* An abstract of a paper read before the Ophthalmological Society, 1917. The full paper will appear in Vol. XXXVII of the *Transactions*.

time (1903) she had + 1·5 D. of hypermetropia in each eye. In 1907 there was still occasional convergent strabismus, In 1909 a tendency to occasional divergence had appeared, although she had good stereoscopic vision and excellent acuity. (Atropin correction, R.E. + 0·75 D. sph., L.E. − 0·25 D. sph.) No change of any importance occurred till 1912 when she complained of double vision when she took her glasses off. With glasses she had visual acuity $= \frac{6}{5}$ in each eye and good stereoscopic vision. The complaints of diplopia, especially on reading, increased, and by April, 1913, a definite divergent strabismus of the left eye, amounting to 14°, had become established. As this remained steady for some months I tenotomised the left external rectus in May, 1913. The primary result of the operation was that her eyes were straight, and she could maintain single vision for long periods, although when tired, she got diplopia, which, however, was now *homonymous* and *not crossed*. At the end of June her refraction, tested without a mydriatic, was R.E. — 0·75 D. sph. ⌒ — 0·25 D. cyl. ax. hor. V.$=\frac{6}{6}$. L.E. — 2 D. sph. ⌒ —0·5 D. cyl. 10° V.$=\frac{6}{6}$. During the autumn of 1913 a variable amount of convergence developed and the homonymous diplopia became so troublesome that the left eye had to be screened. At the end of October she suddenly began to complain of very bad vision. There was now a manifest convergence of 10° to 14°, but the most remarkable feature was an apparent myopia in the R.E. of — 7 D. and in the L.E. of — 9 D. This, however, was variable, and seemed to be in definite relationship to the variations in the amount of convergence. When fully atropised her refraction proved to be in the R.E. — 0·5 D. sph. $= \frac{6}{6}$, L.E. — 1 D. sph. ⌒ — 0·75 D. cyl. ax. hor. V.$=\frac{6}{6}$. The spasm of accommodation reappeared as soon as the atropin was given up.

She has been seen by Lawford, Spicer, the late C. E. Fitzgerald, of Dublin, and Landolt, and as the full descriptions of all these observers agree fairly closely, I may briefly summarize the case as it appeared at this time. The angle of convergence varied from 18° to 32°, occasionally reaching 30° when fixing with the right eye. On the whole the movements were very similar whichever eye she used. The eyes were seldom still, but the non-fixing eye moved out and in constantly, although the movements were much slower and more deliberate than in any form of nystagmus. There was a similar, although slight, variability in the size of the palpebral apertures. The spasm of accommodation reached a height equal to 7 D. of difference in each eye, but by gradually reducing the strength of the lenses, could be almost completely abolished.

Landolt's opinion was that as the spasm followed the tenotomy of the left external rectus it must be in some way due to the interference with muscle balance produced by this tenotomy, and his suggestion was to advance the tenotomised muscle to its original

position. Both Lawford and I had grave doubts as to the expediency of this, and Holmes Spicer had also pronounced in favour of no interference. However, the father, who is a medical man, wished Landolt's suggestion to be tried, and asked me to do the operation. Under the anæsthetic, I found, as I had expected, that the visual axes were parallel, if not slightly divergent, and of course I had to aim at producing by advancement a divergence of approximately 15°, in which I was fairly successful.

In brief, her subsequent history is that her eyes vary from a condition of divergence, with very little spasm, to wild convergence with spasm of 9 D. or 10 D. She will go on comfortably using the right eye for some weeks without getting any spasm, but getting it at once on attempting to use the left eye, and then suddenly will find that the position is reversed, and that now she can only use the left eye. Despite this remarkable ocular history, she has been able to work for the last two years fairly steadily at the Ministry of Munitions, where she is still working.

Since the war began I have seen somewhat similar cases, to one of which I may refer briefly. Private C. J. had a slight concussion of the brain in February, 1915. I saw him in July, 1915, with marked spasm of convergence, blepharospasm and great limitation of visual fields. His refraction without atropin was — 6 D. Sph. in each eye. Under full atropin he proved to be hypermetropic + 1 D. Sph. in each eye. The blepharospasm and convergence spasm gradually diminished without the accommodative spasm being much affected, but by February, 1916, all trace of spasm had gone, his visual fields were full, and his visual acuity was 6/6 in each eye without any glasses.

I have put these two cases on record as examples of true spasm of accommodation, and I think that in each one is justified in adding the term "functional." Certainly the second case was typically a functional disturbance, and though the first case presents many complexities, I have little doubt that it, too, is best grouped under the same heading.

DISEASES OF THE EYE OF OBSCURE ORIGIN*

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THERE must be few ophthalmic surgeons to-day who are satisfied with having labelled a case as "rheumatic iritis." It is a comforting diagnosis from the patient's point of view, because the lay public

*A paper read before the Ophthalmological Society, May, 1917. The full communication will be published in the Society's *Transactions*.